BEFORE THE BOARD OF LAND AND NATURAL RESOURCES

STATE OF HAWAII

In the matter of the Conservation District Use Application of the ESTATE OF JAMES CAMPBELL	)))))	CDUA NO. HA-12/20/85-1830 DECISION AND ORDER

Decision and Order

Honolulu, Hawaii
April 11, 1986

DECISION AND ORDER

The Board of Land and Natural Resources (BLNR) hereby grants the Estate of James Campbell and the True/Mid-Pacific Venture a Conservation District Use (CDU) permit:

(a) to conduct geothermal exploratory activities to determine the existence of a geothermal resource capable of providing up to 100 megawatts of electrical energy; and

(b) to conduct actual development activities for the purpose of producing up to 25 Megawatts of electrical power within the Kilauea Middle East Rift Geothermal Resource Subzone (KMER/GRS) and for purposes of satisfying the electrical energy requirements for the Island and County of Hawaii. The boundaries of the Kilauea Middle East Rift Geothermal Resource Subzone are delineated on the map attached hereto as Appendix A.

SCOPE

The scope of this permit is defined as follows:

1. "Geothermal exploratory activities" are defined to include those activities which will allow the Applicant or its representatives to determine the nature, location, and extent of the KMER/GRS's geothermal resources and include the drilling of geothermal wells.

(a) ~~Applicant may drill a sufficient number of wells to produce 25 Megawatts of electrical energy.~~ However, exploration activities beyond the firm confirmation of 25 Megawatts for near term development shall be

for the purpose of determining generally the existence of a geothermal reservoir capable of providing up to 100 Megawatts of electrical energy.

(b) To this end, the Applicant may drill sufficient additional number of wells beyond those needed to produce 25 Megawatts in order to determine whether another 75 Megawatts of electrical energy could be produced from lands subject to this CDU permit.

2. Upon completion of the exploration phase in this Order and approval of a development plan as provided in paragraph 33 below, the Applicant shall be permitted to develop up to 25 Megawatts of electrical power for purposes of satisfying the electrical energy requirements for the Island of Hawaii.

3. The BLNR approves the development by the Applicant of geothermal energy in excess of the initial 25 Megawatts (but not greater than 100 Megawatts) under this Order only upon the condition that prior to initiating any such further development, the Applicant shall file information with the Board showing that:

(a) it has complied with all of the terms and conditions in this Order;

(b) there is a need for such additional energy production; and

(c) the development of additional geothermal facilities can continue to meet and be in compliance with applicable health and safety requirements of applicable, Federal, State and County statutes.

4. Any development beyond the initial 25 Megawatts may be approved in increments. A development plan addressing the information required in paragraph 31 of this Order shall be submitted by the Applicant to the

DLNR for ministerial approval prior to any further development.

5. ~~Any proposal~~ to explore for or develop geothermal energy in excess of the 100 Megawatts for whatever purpose shall require a new application.

CONDITIONS

The uses permitted by this Order are subject to the [redacted]g [redacted]:

Exploration Area

1. Applicant shall [redacted] in accordance with Section 13-183-55 of Chapter 183, Rules of Leasing and Drilling of Geothermal Resources prior to conducting exploration access or drilling activities, [redacted] delineating its specific anticipated activities to implement this Order. The scope of planned exploration activity shall follow or be conducted in a manner consistent with the sequence described in the Final Supplemental Environmental Impact Statement (EIS), pp 14-15.

2. No wells or power plants shall be sited within 9,500 feet of the eastern boundary of the Applicant's property line near Kaohe Homesteads (see Appendix A).

3. No wells or power plants shall be sited within 3,500 feet of the southeastern boundary of the Applicant's property line near Upper Kaimu Homesteads (See Appendix A).

4. Applicant may conduct directional drilling.

Commencement

5. The Plan of Operations shall be submitted within two years of the issuance of the final Order approving the CDU Permit. Exploration activities shall be commenced within two years from the date of approval of the Plan of Operations. Pursuant to Section 13-2-21(C)(1), [redacted] requirement and [redacted] activities due to the complexity of geothermal exploration.

6. The [redacted]

a) [redacted]

Abated venting shall be permitted only when accompanied by appropriate noise and chemical abatement techniques approved by Department of Land and Natural Resources (DLNR). Abated venting, when required and approved, shall be restricted as follows:

(i) venting may occur only between the hours of 9:00 a.m. and 6:00 p.m. exclusive of weekends and State holidays; venting shall not occur for more than a continuous eight-hour period. For good cause shown and when no reasonable alternatives exist, the DLNR may modify these restrictions.

(ii) venting shall be scheduled for periods when meteorological conditions are conducive for minimum impact to adjacent

residential areas; and

(iii) ~~forty-eight~~ (48) ~~hours~~ advance notice shall be provided to DLNR, the County of Hawaii, designated representatives of residents in adjacent communities, and the Hawaii Volcanoes National Park as to the scheduled venting.

~~Unabated open venting~~ of geothermal emissions ~~is prohibited~~ except by prior written permission of the DLNR or in emergency situations.

(b) [redacted]

Applicant shall submit to DLNR for [redacted] management plan relative to access, parking, drainage, fire protection, safety, signs, lighting provisions, and changes in the landscape, for review and approval.

(c) Air Quality Monitoring Program [redacted]

Applicant shall submit to DLNR for [redacted] an Air Quality Monitoring Program to be ~~implemented~~ when the well drilling ~~period~~ begins and shall continue through the term of the project. Such data shall be submitted ~~to~~ the ~~DLNR~~ and the ~~County~~ of ~~Hawaii~~ on a quarterly basis.

The program shall include provisions for installation, calibration, maintenance, and operation of recording instruments to measure air contaminant concentrations. The specific elements to be monitored shall include the following:

(i) hydrogen sulfide and sulfur dioxide;

(ii) mercury;

(iii) radon; and

(iv) other elements and emissions as may be determined by the DLNR.

The number of stations involved in the continuous monitoring program shall include, but not be limited to, at least one (1) station each within Hawaiian Acres Subdivision, Waikahekahe Iki, the Kaohe Homesteads, the Upper Kaimu communities, along the Southern border of the KMER/GRS near area "D" as depicted on Figure 5 of the Final Supplemental EIS and any other locations as required by the DLNR. Rain water sampling shall be done within adjacent and nearby residential communities. Measurements shall be made of total suspended particulates. Said plan and program shall be modified as deemed necessary by the DLNR based on information derived in the initial phase or phases of the project in order to address activities to be undertaken subsequent to such initial phases.

Where appropriate, U.S. EPA monitoring guidelines and protocol will be followed and standard U.S. EPA quality assurance documentation will be provided for the monitoring program. [redacted]

Applicant shall meet all Federal, State, and County air quality guidelines and regulations. Prior to the adoption of air quality standards by the State Department of Health, the Air Quality Advisory Committee Guidelines shall be binding. In summary, the proposed Department of Health standards are as follows:

(i) maximum ambient: 100 parts per billion;

(ii) ambient - maximum incremental degradation: not more than 25 parts per billion for 1 hour average once/year;

(iii) best available control technology; and

(iv) emissions: 8.5 lbs/hour or 150 grams/gross Megawatt hour, whichever is greater.

Applicant has agreed to and the Board hereby directs that the best available control technology (BACT) shall be utilized for the control of hydrogen sulfide (H_2S) emissions through the term of the project. Applicant has also agreed that hydrogen sulfide emissions during all phases of exploration and development activities shall not exceed regional air quality concentration of 30 parts per billion (1 hour average) above regional background levels at the nearest residential property. In the case of conflicts between standards cited above the most restrictive shall apply. The standards and guidelines in this Order shall apply at the Applicant's property line.

(d) Meteorological Monitoring Program

Applicant shall provide, install, calibrate, maintain, and operate a Meteorological Monitoring Program for continuous meteorological monitoring at the subzone or at other locations as may be required by the DLNR. The data shall be provided in a format that is acceptable to the DLNR, and made available to DLNR and the County of Hawaii on a monthly basis and shall include temperature, wind velocity, wind direction, precipitation, vertical air temperature, and other information deemed

necessary by the DLNR.

(e) Noise Monitoring Program

A Noise Monitoring Program to be implemented prior to the exploratory well drilling and testing period begins shall be submitted to DLNR for ministerial approval. Said plan and program shall be submitted to the County of Hawaii and other appropriate government agencies for review and comment prior to its approval.

The Noise Monitoring Program shall include an evaluation of predicted noise levels for selected sites in the residential areas near the proposed drilling and testing operations in the KMER/GRS. The evaluation shall include, but is not limited to, the collection of meteorological data simultaneously with ambient sound level monitoring. The program shall simulate actual sound levels at each of the proposed well sites and measure noise levels at selected residential areas using calibrated noise sources. The noise evaluation shall be submitted to DLNR for ministerial approval prior to approval of permission to drill at each site. This plan should be designed so that any complaints about noise can be correlated with noise measurements, the meteorological conditions, and the type of operations which occurred at a well site at a particular time and day. The number and location of on-site and off-site monitoring stations shall be subject to the determination of DLNR. Mobile stations may be used.

The noise level monitoring and standards shall be applied at receptors located in at least one (1) station each within Hawaiian Acres

Subdivision, Waikahekahe Iki, the Kaohe Homesteads, the Upper Kaimu communities, along the Southern border of the KMER/GRS near area "D" as depicted on Figure 5 of the Final Supplemental EIS and any other locations as required by the DLNR.

The data obtained shall be available on request by the appropriate governmental agencies, including the County of Hawaii. The noise monitoring program shall be in operation during the term of the project.

Until such time as noise regulations are adopted by the State or County, the Applicant or its representative shall comply with the following guidelines:

(i) a general noise level of 55 dba during daytime and 45 dba at night shall not be exceeded at the Applicant's property line except as allowed under (ii). For the purposes of these guidelines, night is defined as the hours between 7:00 p.m. and 7:00 a.m.;

(ii) the allowable noise levels may be exceeded by a maximum of 10 dba for impact noise; but in no event, may this impact noise constitute more than 10 percent of the time within any 20-minute period;

(iii) the noise level guidelines shall be applied at the Applicant's property line; and

(iv) sound level measurements shall be conducted using standard procedures with sound level meters using the "A" weighting and "slow" meter response, unless otherwise stated.

The above guidelines shall be enforced and may be administratively adjusted by the DLNR based on information derived in the initial phase or phases of the project in order to address activities to be undertaken subsequent to such initial phases.

(f) Archaeological Plan

An Archaeological reconnaisance survey for clearing operations on specific sites for project facilities including roads, drilling and power plant sites shall be submitted to DLNR for ministerial approval. Based upon the survey, the Applicant shall submit a plan to address methods to avoid archaeological sites that are determined worthy of preservation or removal. More specifically:

(i) a full archaeological reconnaisance survey shall be conducted for any area selected to be cleared for any project operation, prior to the initiation of clearing operations. The survey shall identify and evaluate sites and features of potential archaeological significance present within the areas to be cleared. It shall be conducted in accordance with the standards for reconnaisance level survey recommended by the Society for Hawaiian Archaeology (SHA).

(ii) the areas to be surveyed shall include the proposed access corridors, drill sites, power plant sites and any other areas to be impacted by construction activities. These areas will be clearly marked on-the-ground prior to any archaeological field work.

(iii) the area to be surveyed shall include an area two to five times larger than the actual access road corridors, drill sites, power plant sites, and any other development areas -- to insure that any archaeological resources in the immediate vicinity, but not actually within a specific area to be impacted will not be inadvertently damaged by construction activities. The surveyed area should insure that the full context of archaeological remains within the specific impact areas will be determined (e.g., the full significance of a seemingly isolated structure cannot be accurately determined if it is part of a larger, but unidentified, complex of structures).

(iv) an archaeological research design to guide all future archaeological work within the project area will be formulated. A research design will be a plan for conducting an archaeological investigation.

(g) Clearing

Prior to the commencement of any grubbing, grading or clearing activities, the Applicant or its representative shall:

(i) provide a metes and bounds description of proposed well sites, the power plant sites, and access roads to the DLNR for approval;

(ii) mark the boundaries of the well sites, power plant sites, and access roads such that no construction or transportation equipment shall be permitted beyond such boundaries;

(iii) receive approval on archaeological and biological reconnaissance surveys for specific sites or facilities; and,

(iv) comply with all requirements of Chapter 10, Erosion and Sedimentation Control, Hawaii County Code, as amended.

(h) Biological Survey

The Applicant or its representative shall submit to DLNR for ministerial approval a biological survey, monitoring and assessment program. The program shall address the following:

(i) biological reconnaissance surveys to be conducted for those areas to be impacted by exploration and development activities, including those areas altered by any clearing for drill sites, future power plant sites, access roads and utility or transmission corridors. Such surveys shall be conducted in conjunction with preliminary land surveying activities and shall be submitted to the DLNR for review and approval and to the County of Hawaii and other appropriate government agencies for review and comment prior to approval of commencement of construction activity.

(ii) Applicant shall establish baseline biological data for the contiguous area two to five times larger than the area to be cleared.

(iii) monitor the spread of exotic plants into the project area along roads and clearings and the implementation of appropriate control methods approved by the DLNR.

Suitable areas within the subject property shall be identified and designated, by mutual agreement of the Applicant and the DLNR, as botanical sanctuaries.

(i) Lighting

Lights on the drilling rig and physical components and lights required during operations at the drilling site shall be shielded and of the lowest intensity as is consistent with worker safety, security, and efficient operations. In any event, all activities and facilities shall meet the requirements of Chapter 14, Article 9, Outdoor Lighting, of the Hawaii County Code, as amended.

(j) Drilling Report

Applicant shall submit a status report to DLNR and the County of Hawaii on a semiannual basis, or within 30 days whichever occurs first, of the completion of any exploratory well. The status report shall include, but is not limited to:

(i) a detailed description of the work undertaken during the current reporting period, including well test data, exploration results and drilling logs;

(ii) well history report, well summary report and a supplementary notice;

(iii) a log of the complaints received and the responses;

(iv) a description of the work being proposed over the next reporting period; and

(v) any other information that DLNR may require which will address environmental and regulatory concerns involving the requirements of the CDU permit.

(k) Emergency Plan

Applicant shall submit and obtain approval from the Hawaii County Civil Defense Agency and the DLNR of a plan of action to deal with emergency situations such as volcanic activities, earthquake, fires and well bore ruptures, and blowouts which may threaten the health, safety, and welfare of the employees and other persons in the vicinity of the proposed project. The plan shall include procedures to facilitate coordination with appropriate State and County officials and the evacuation of affected individuals.

Reforestation

7. All denuded areas on and around completed or abandoned drilling sites shall be reforested in a manner acceptable and approved by the DLNR. In the case of total abandonment of the project, Applicant shall restore all denuded areas, including the access road and secondary field roads in a manner acceptable and approved by the DLNR.

Water

8. The Applicant or its developer shall conduct water analyses before and periodically during drilling of the first well in each development area. Samples and analysis of catchment water in Kaohe Homesteads and Upper Kaimu Homesteads shall be conducted by a licensed water quality testing laboratory and results provided to the State Department of Health and the County of Hawaii as well as DLNR within 15 days after samples are analyzed.

see Plan & Ops page 11 - plans are to bury solids on-site.

Disposal

9. A disposal site or sites, approved by the DLNR and State Department of Health, shall be provided for sump contents and other waste materials to be disposed of from the drilling activity.

Debris

10. On-site burning of debris material is prohibited unless expressly authorized in writing by the DLNR and all applicable State and County agencies.

Ponds

11. All sump/ponds shall be purged in a manner meeting with the approval of the DLNR and State Department of Health.

Aesthetics

12. In the design and construction of all physical components, Applicant shall propose measures to minimize aesthetic and scenic impact and to preserve the natural beauty of the area. Such measures shall, but is not limited to, orientation of buildings, when feasible, with the narrow dimension towards any view corridor from which large numbers of the public would be able to observe the facility, paint to blend with the background for the facility, and the use of nonreflective, light absorbent material and textures. Applicant shall be subject to the County building code. Prior to commencement of any construction or

improvements, the Applicant shall submit four (4) copies of each of the final locations, maps, plans, and specifications to the Chairperson for approval pursuant to DLNR rule 13-2-21(a)(7).

see plans & Ops pg. 10 - approval & off-site matls issued w/ plans & Ops

Road Fill

13. All cut and fill materials for road construction shall be derived from the project site. No imported materials shall be allowed unless prior written approval by the DLNR is obtained.

Clearing Approval

Clearing "approval" refers to the Plans & Operations and the Archaeological/Ecological surveys which were reviewed and approved.

14. All clearing for construction proposes shall require prior ministerial approval by the DLNR. Ground cover of slopes over 40% shall not be removed unless specifically authorized by the DLNR. (refer to page 12)

Traffic

15. Heavy truck traffic into the project site shall be restricted to daylight hours except for emergencies and unusual operational conditions. All access roads shall be maintained in good condition by the Applicant including roads over other private property.

Litter

16. All litter shall be collected and disposed of daily.

Blasting

17. No blasting operations shall be allowed without the prior written

approval of the DLNR.

[redacted]

18. Applicant [redacted] on or before the last working day of the month a [redacted] sold, and used, and the amount of fluid injected for that month as the case may be.

[redacted]

19. Applicant or its representative shall maintain a record in a permanent form which is suitable for inspection and shall make such record available on request to the DLNR, the State Department of Health, and the County of Hawaii and any such authorized Federal, State, or County officials as they may designate. [redacted] but is not limited to:

(a) occurrence and duration of any start-up, shut-down, and operation mode of any well/facility;

(b) performance testing, evaluation, calibration checks,and adjustments and maintenance of the continuous emission monitors that have been installed; and

(c) emission measurements reported in units compatible with applicable standards and guidelines.

[redacted]

20. Applicant shall grant unrestricted access, subject to safety measures normal and necessary during operations, to authorized governmental

representatives, including the County of Hawaii, or to consultant and contractors hired by governmental agencies for inspection, enforcement, or monitoring activities.

[redacted]

21. (a) Applicant shall designate an individual and an alternate who are to be readily available at all times and who has authority to act on behalf of the Applicant for the purposes of supplying information and responses deemed necessary by the authorized governmental representative who is involved with such activities.

(b) [redacted] number [redacted] a day for receiving noise, odor, or other complaints and shall have an employee available at the project site, 24 hours a day, to respond to such complaints. [redacted] complaints received and their responses to be submitted to the DLNR quarterly.

Indemnification

22. (a) Applicant, its successors or assigns, shall indemnify and hold the State of Hawaii harmless from and against any loss, liability, claim or demand for property damage, personal injury and death arising out of any act or omission of the Applicant, its successors, assigns, officers, employees, contractors, and agents under this Order and permit or relating or connected with the granting of this permit.

(b) Applicant shall protect, indemnify, defend and hold the State of Hawaii harmless against loss, damages, claims and liens of every kind and

character (including but not limited to Workmen's Compensation claims and claims of third parties) which may be occasioned by Applicant's use or occupation of the Land or any portion thereof or any easement for ingress or egress thereto or by reason of the operations or working of Applicant, its employees, agents or independent contractors upon the Land, or any easement for ingress or egress thereto, including injuries to persons or loss of life or damage to property or nuisance and including, but not limited to, any pollution or flooding of the surface or subsurface waters or any pollution of the air, with said indemnification to apply irrespective of whether claims allege the cause to be sudden or gradual.

Insurance

23. Furthermore, Applicant will at its own expense effect and maintain at all times term insurance coverage for automobile liability, professional liability and comprehensive general liability for all risks with respect to the subject land under policies naming the State of Hawaii as an additional insured by an insurance company authorized to do business in Hawaii, such insurance being for injury to one or more persons in any one accident or occurrence and for property damage, respectively, with minimum limits of $5 million or such higher limits as is consistent with prudent business practice prevailing from time to time and with the risks involved in the geothermal industry, and will from time to time deposit with the DLNR current certificates of such insurance and upon request therefor true copies of such insurance policies. Such insurance policies that are to be provided by Applicant shall contain a clause stating such

policies are primary and non-contributing with any other insurance that may be in force on behalf of the State of Hawaii, which shall not be construed to prevent Applicant from carrying excess coverage.

Pollution

24. Pollution of the ocean and tidelands, rivers, or other bodies of water, and all impairment of and interference with bathing, fishing, or navigation in the waters of the ocean or any bay or inlet thereof is prohibited, and no brine, minerals, or any refuse of any kind from any well or works shall be permitted to be deposited on or pass into waters of the ocean, any bay or inlet thereof, rivers, lakes, or other bodies of water, without specific written State authorization.

Health Hazard

25. No substances which may be produced from any well drilled upon the lands shall be blown, flowed, or allowed to escape into the open air or on the ground in such a manner as to create a health hazard, which shall specifically include but not be limited to noise, air or other pollution, and other activities which disturb the occupier's or his tenant's use of the lands. Subject to the foregoing, the Applicant may bleed substances into the atmosphere so long as such operations are lawfully and prudently conducted in accordance with good geothermal drilling and exploratory testing practices and are not otherwise in violation of the law.

Compliance with land laws

26. The Applicant shall comply with all valid requirements of all municipal, state, and federal laws and regulations pertaining to the lands and Applicant's operations, which are now in force or which may hereafter be in force, including, but not limited to, all water and air pollution control laws, and those relating to the environment. The State of Hawaii, acting in its governmental capacity, may regulate the drilling, location, spacing, testing, completion, production, operation, maintenance, and abandonment of a well or wells or similar activity as well as the construction, operation, and maintenance of any other facilities in the exercise of its police powers to protect the public health, welfare, and safety as provided in the regulations.

Fines

27. Any violation of any particular condition and each occurrence thereof shall be subject to a fine as provided by law. The DLNR shall have authority at all times to close, shut down, terminate, modify, or otherwise impose limitations on any well or any geothermal activity for violations which may endanger public health or safety. The Applicant and its agents, assigns, and successors in interest shall be liable for each and every administrative cost incurred by any and all State and County agencies or personnel which may be required for the investigation and enforcement of violations.

Monitoring Costs

28. All monitoring program costs shall be borne by Applicant. The

Department shall reserve the right to approve consultants for such programs.

Compliance with laws

29. Applicant shall comply with all Federal, State and County laws, statutes, regulations and ordinances listed in Appendix "B" that may apply.

Continuing jurisdictions

30. The Board shall exercise continuing jurisdiction over all exploratory and development activities authorized by this Order.

[redacted]

31. Applicant shall at all times apply the "Best Available Control Technology" (BACT) with respect to geothermal emissions and noise abatements during all phases of the project, including well drilling, testing, and power plant operation. "[redacted] means the maximum degree of control for noise and air quality concerns, taking into account what is known to be practical but not necessarily in use. [redacted] and Federal agencies involved in the [redacted] of geothermal development.

Soil and Water Conservation

32. Use of the area shall conform with the program of the appropriate

soil and water conservation district or plan approved by and on file with the DLNR.

Sanitation

32. When provided or required, potable water supply and sanitation facilities shall have the approval of the DLNR, State Department of Health and the County of Hawaii.

[redacted]

33. (a) ~~Prior to any development~~, the ~~Applicant~~ or its representative ~~shall submit a complete development plan describing all proposed surface and structural improvements for the proposed activities~~ to the DLNR ~~for review and approval~~ and the County of Hawaii and other appropriate government agencies for review and comments prior to its approval by the DLNR.

(b) [redacted]

- ~~well and power plant site locations~~
- ~~additional access corridors~~
- ~~pipeline corridors~~
- ~~electrical transmission line corridors~~
- ~~conceptual construction plans~~
- ~~description of abatement systems~~

Commencement of Development

34. Development of an electrical generation facility shall commence within five years after completing a successful exploration phase of up to 25 Megawatts.

Dated: Honolulu, Hawaii, April 11, 1986.

IT IS SO ORDERED.

SUSUMU ONO
Chairperson and Member,
Board of Land and Natural
Resources

J. DOUGLAS ING

Board Member

ROLAND H. HIGASHI

Board Member

MOSES KEALOHA

Board Member

- EXTRA -

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 621
HONOLULU, HAWAII 96809

June 16, 1989

MEMORANDUM

TO: Manabu Tagomori, Deputy Director, Commission on Water Resource Management

FROM: Ralston H. Nagata, State Parks Administrator

SUBJECT: True/Mid-Pacific Geothermal Venture's Plan of Operations for Geothermal Exploration Activities -- Archaeological Research Design
Multiple, Puna, Hawaii

HISTORIC SITES SECTION CONCERNS:

This responds to the archaeological research design which you passed to Dr. Cordy in the afternoon of June 13, 1989, and follows up on his conversation with you on June 15, 1989.

Generally, we find the research design acceptable. We believe that some points should be made clearer, and we have thought of some additional points. Rather than require the applicant to revise, which would take extra time, we have prepared a revised document. This document includes most of the points in the submitted design. It adds a few minor points. It also clearly presents each needed task. If this revised document is acceptable, then we believe that the archaeological research design condition of the CDUA can be considered to have been met.

In the case of the first development area, Bonk's surface survey adequately covers the access road and the first drill site. Since this survey has been done and covered all project areas, Step 1 of the approaches called for in the research design ("Background Preparation -- Predictions") can be waved. (It must be done for future projects, and it will cut down areas needing survey.) For this first development area (the access road and drill site), the only survey task remaining is archaeological monitoring, which should occur only in soil areas after grubbing and grading of the road and drill site.

Note: Development Area A's access road to the proposed power plant and the plant area are not covered in Bonk's survey, so those project elements should be treated as a separate historic preservation review case, starting with Step 1 in the research approaches of the research design.

RALSTON H. NAGATA

Attachment (Revised Design)

cc: J. Kennedy, Archaeological Consultants of Hawaii

R E S E A R C H D E S 1 G N

F O R

A R C H A E O L O G 1 C A L S U R V E Y M E T H O D S

For:

ARCHAEOLOGICAL PLAN
GEOTHERMAL EXPLORATION ACTIVITIES
TRUE/MID-PACIFIC GEOTHERMAL VENTURE

Required under CDUA HA-1830

INTRODUCTION

A variety of archaeological sites are expected in the vast forest lands where True/Mid-Pacific Geothermal Venture will be conducting its geothermal exploration activities. Although the sites' distribution generally will be sparse and although most project activities may well miss the sites, it is important to have adequate plans to identify historic sites, so the sites can be avoided or appropriately mitigated. Special identification problems exist in forest lands, and for this reason, an archaeological research design for archaeological survey methods was required under CDUA HA-1830 (Findings of Fact, Consultions of Law and Decision and Order, April 11, 1986) as part of an Archaeological Plan.

PREHISTORIC & EARLY HISTORIC LAND USE IN THE PROJECT AREA AND ANTICIPATED HISTORIC SITES

Historical and archaeological work in this area, as well in other similar environmental zones on Hawaii Island, indicate that prehistorically such areas were used for:

1. Forest Product Exploitation. Bird-feathers, timber, vines, etc. were collected in the forests at or near work sites, and campsites were nearby. These sites should be scattered around much of the project area, in low densities for any one point in prehistory.
2. Burial. These sites are expected to be focused in certain areas.
3. Major inland trails across many ahupua'a and associated campsites. These sites should be focused in linear corridors.
4. Agriculture in the seaward-most reaches. These sites may tend to be fairly dense, but they will again be in a small part of the project area, in the seaward portions.

Archaeologically, the sites should have the following characteristics.

1. Forest Exploitation sites. Probably there will be no surface stone architecture (as huts and shelters likely were simply pole-and-thatch). Some campsites, however, will be in caves. Each site may be a small scatter of

flaked stone, broken or non-curated tools, food remains (bone, shell), and firepits. If repeated use occurred, then the density of remains would be greater. Such campsites are documented in caves in forest areas. Such cave campsites have yielded a great deal of important information on the age of use of an area, on birds and plants collected, etc. Campsites and exploitation sites have yet to be documented in open-air contexts, and in such cases, they are expected to primarily be subsurface, buried sites.

2. Burials. Burials in forest areas have been identified in two forms -- burials in caves (often in caves also used as campsites) and in stone platforms and pavings on cinder cones. These sites contain important information on age of permanent occupation in an area, on social organization, on health, on demography; additionally, they are highly significant sites culturally for native Hawaiians.
3. Trails. Trails in forest areas are expected to be extremely difficult to identify, as worn paths and cuts through the forest will have been covered over by later sediments and by the forest growing back. On bare a'a flows, there may be some visible features -- eg., crushed paths, steppingstones. Campsites along the trails should have firepits, food remains, and some scattered artifacts. Some of these may have been in caves, but others will have been open-air camps, and they may have no surface architecture and be buried like the forest exploitation camps. Trails and their associated campsites can tell us a great deal about the time periods of travel across regions, which is extremely important early in prehistory. They can also provide information on items being carried and perhaps exchanged.
4. Agricultural Sites. These sites commonly have some kind of stone-work -- small oval clearings lined with stones, small terrace lines, walls, etc. These sites contain important chronological information on permanent settlement of an area, population expansion, and agricultural expansion.

SITE IDENTIFICATION PROBLEMS

Common archaeological surface survey (labelled reconnaissance survey, intensive survey, etc.) can identify cave sites used for forest exploitation and/or burial, can

identify agricultural sites, and can identify trails on bare a'a flows. However, cave sites are only expected in older pahoehoe areas, not on a'a flows and not in recent pahoehoe flow areas. Platform and paving burial sites are expected to be restricted to cinder cones. Agricultural sites will be at lower, seaward elevations in areas with soil. This means that a'a flows and recent pahoehoe flows are not expected to include sites, unless a visible trail remnant is found on a bare a'a flow.

The open-air sites in forest areas -- trail sites (and their associated camps) and forest exploitation sites not in caves -- will likely be subsurface, buried. They will be also be small. Common surface survey will not be able to identify these sites when they are subsurface. These sites are expected in soil areas within kipuka, on old pahoehoe flows, and on older a'a flows lacking rough surfaces. These sites might be surface remains on bare lava in kipuka, on old pahoehoe flows, and on older a'a flows lacking rough surfaces, and in such a case common surface survey could identify them; but it appears unlikely that these sites will be found on the surface. They are not anticipated on rough a'a flows (except rare trails) or on recent pahoehoe or a'a flows.

The above problems indicate two special conditions for site identification in this area:

1. Some areas appear not to need survey -- eg., rough a'a flows and recent lava flows (post-1880 flows, whether pahoehoe or a'a). These areas need to be identified and be clearly marked off as areas needing no archaeological work. [See below for special approaches to trails on a'a flows.]

2. Soil areas may contain subsurface exploitation and trail related sites. Special archaeological approaches need to be devised for these areas to try to identify these sites.

RESEARCH APPROACHES

Archaeological survey work needs to be considered for all areas where proposed project work will disturb the land surface. The following tasks will be done for each specific development activity that will disturb land surfaces. For example, development activity #1 is the currently planned access road and drill site. Activity #2 might be the proposed power plant in Area A and the access road from the drilling site. Activity 3 might be the University of Hawaii's SOH area and its access road (if different).

1. Background Preparation -- Predictions. Prior to each activity, the first step shall be to determine the following:

a. Check the historic literature (eg., Holmes 1985) and archaeological literature to determine if known historic or archaeological sites are in the project vicinity. This is crucial for the trails (eg., that used by Wilkes' expedition), so their approximate location can be carefully examined for campsites.
b. Identify and distinguish older bare a'a flows and post-1880 lava flows. Mark these off as areas not needing archaeological study. Kipuka and high terrain features (eg., cinder cones) within such recent flows that are remnants of older flows must be identified, for these areas need study.
c. Identify and distinguish all older bare pahoehoe flows, soil-covered pahoehoe and a'a flows, kipuka, and cinder cones in the project area.
d. If the project is in the seaward extremities, identify from aerial information areas with cultigens (bananas, coconuts, breadfruit), as these areas will need study.

2. Archaeological Surface Survey. Prior to construction, surface survey shall be done for the project areas on all older bare pahoehoe flows, soil-covered pahoehoe and a'a flows, kipuka, and cinder cones in the project area. Special attention shall be given to the following:

a. In pahoehoe areas, special attention shall be given to the identification of lava tube caves, since such caves may have served as forest exploitation camps and/or for burial sites and as trail campsites.
b. On cinder cones, special attention shall be given to identification of stone platforms and pavings that might have served as burial sites.
c. On older bare pahoehoe lava flows, special attention shall be given to the possible identification of trails. The interface of these flows, kipuka, and soil-covered areas with rough a'a flows will be carefully checked to see if trails can be identified entering a'a flows, visible architecturally as crushed paths, stepping stones, etc. If such trails are found entering a'a flows, then the trail will be followed out through the flow within the project area.
d. If historically or archaeologically known trails are in the project area, the general trail corridor area will be carefully checked (except on rough a'a and recent flows) for possible surface evidence of campsites (caves or open-air camps).

3. Archaeological Monitoring of Soil-covered Areas After Initial Grading and Grubbing. As a special effort to try and identify subsurface remains of trail and forest exploitation campsites and forest exploitation working areas, this monitoring shall occur. It shall only be done in soil areas. The cuts made during grubbing and grading will be inspected to see if these sites can be identified.

4. Consultation will occur with the State's Historic Sites Section at the end of each of the above tasks. A written report for items 1-3 will be prepared within 2 months after the end of monitoring, and this report shall be submitted to the Historic Sites Section. If historic sites are found during surface survey work or monitoring work, the Historic Sites Section will be contacted and, in consultation with that office, the significance of the sites will be evaluated and acceptable mitigation measures shall be devised. As noted in the CDUA application, if these sites are found during the surface survey, project elements (eg., roads, drill sites) will be moved to avoid these sites. If sites are found during monitoring, mitigation will be worked out with the Historic Sites Section.

The above research approaches shall be used for the first three major project activities. At that point, consultation with the State's Historic Sites Section will occur, and the success of these methods will be evaluated. If some methods are not successful in identifying historic sites, then they will be dropped. If some other methods seem worth trying, then they will be added. As a result of the agreements from that consultation, the Historic Sites Section will revise the existing research design.

May 23, 1989

MEMORANDUM

TO: Mr. William Paty, Chairperson

FROM: Manabu Tagomori, Deputy Director
Commission on Water Resource Management

SUBJECT: Staff Analysis and Report of True/Mid-Pacific Geothermal Venture's Request for Modification to the Conditions Set Forth in the BLNR's Decision & Order of June 18, 1986 (CDUA HA-12/20/85-1830)

BACKGROUND

The Board of Land and Natural Resources (BLNR) in its Decision and Order (D/O) dated April 11, 1986, authorized the exploration and development of geothermal resources on Campbell Estate land (TMK: 1-2-10:03) located in the Puna District, Island of Hawaii.

The D/O set forth procedures and conditions related to the permitted geothermal exploration and development activities such as, but not limited to, abated venting of geothermal wells, air quality monitoring and noise monitoring plans and programs.

Pursuant to the D/O conditions, these plans and programs are required to be submitted to the Department for ministerial approval prior to implementation by True/Mid-Pacific Geothermal Venture (Applicant).

DISCUSSION

The Applicant in compliance with the D/O has submitted to the Department for ministerial approval, Environmental monitoring plans and programs for their planned geothermal exploration activities.

In conjunction with their request for approval, Applicant has requested to modify three specific conditions prescribed in the D/O relating to abated venting, air quality monitoring and noise monitoring.

The Applicant's requested modifications, the related D/O conditions, and our staff's position are outlined below:

ABATED VENTING

(1) Applicant's Request and Comments

Applicant proposes abated continuous-flow testing (essentially abated venting) of each geothermal well for a period of 30 to 45 days. Applicant states that continuous-flow testing is standard industry practice for well testing and reservoir analysis and will reduce the possibility of thermal shock and damage to the well casing and cemented annulus which may result due to periodic (on-off) shutting down of the well., Also, the need for continuous flow testing is critical in order to avoid the interruption and change in flow rates during flow test measurements.

Applicant further states that "there is no reasonable alternative known to be feasible in the geothermal industry that would allow reservoir analysis to the degree of accuracy that is necessary to justify the commitment and expenditure of millions of dollars for a power plant to utilize the resource".

D/O Condition

Abated venting of geothermal wells may take place only between 9:00 am to 6:00 pm, Monday through Friday, exclusive of holidays and not longer than a continuous 8-hour period. With reference to abated venting, the D/O states that "for good cause shown and when no reasonable alternatives exist, the Department may modify these restrictions".

Staff's Position:

Staff concurs that continuous (30-45 days) flow testing is necessary to determine reservoir characteristics and production capability, and that no alternative testing method exists.

(2) Applicant's Request and Comments

Applicant requests approval to conduct open (unabated) venting of each well, for a maximum period of 8 hours with only one well to be open-vented at any given time.

D/O Condition

Unabated open venting of geothermal emissions is prohibited except by prior written permission of DLNR or in emergency situations.

Staff's Position:

Staff recommends (prior to drilling) approval of a one-time only 8-hour open-venting period necessary for initial development of each newly drilled well. Any subsequent open-venting request is to be approved in writing on a case-by-case basis after a well is drilled.

AIR QUALITY MONITORING

(3) Applicant's Request and Comments

Applicant proposes the following program in lieu of the D/O prescribed conditions:

a. Operation of a meteorological monitoring station located at the drill site.

b. Use of a mobile monitoring van downwind of the drill site. The mobile monitoring van will be located as close as possible to the maximum estimated impact area for each drill site.

c. Passive H_2S monitors will be operated at a radius of approximately 3,000 feet in the primary downwind direction from each drill site.

d. The mobile monitoring station will monitor air quality and meteorological conditions for a minimum of one week before emissions commence from the well being drilled and continue during drilling, venting and testing.

e. That the monitoring program described above is consistent with EPA protocol and guidelines and the nature of the incremental geothermal exploration and development activities authorized in the project area.

Applicant states the following:

a. The air quality monitoring conditions set forth by the BLNR's D/O addresses monitoring requirements for both exploration and production phases of the project.

b. The proposed monitoring plans as submitted, are directed at the exploration phase of the project and as such, should not be required to meet all the D/O condition, some of which are more specifically related to production activities.

c. The air quality monitoring proposed for the initial increment of exploration will measure the air quality in the area of maximum estimated impacts due to emissions from drilling, venting, and flow testing of exploratory wells.

d. That geothermal wells do not meet EPA criteria of major permanent sources of emissions. Thus, the emissions from well drilling, venting and testing during operations as part of any operating power plant, are not large enough to constitute a major source and, therefore, are not subject to EPA PSD review requirements.

e. Selecting the correct locations for a monitoring station for an area with multiple permanent emission points will be more applicable for the project during the production stage. However, for the proposed initial exploration phase, there will be only one temporary source (except for volcanic emissions) emitting at any one time during drilling and testing of wells.

f. There will only be one well open (unabated) venting at any given time and then only for a maximum of eight hours. After venting, each well will be flow tested (abated) for 30-45 days continuously, using appropriate pollution and noise abatement systems.

g. While the D/O requires the applicant to submit the proposed air quality monitoring plan to DLNR for ministerial approval prior to drilling, it is the Department of Health (DOH) who has the responsibility to implement and enforce the regulations for the EPA air quality programs in Hawaii, including the monitoring requirements.

(The Applicant has received approval of the proposed monitoring plans and programs from DOH.)

D/O Condition

a. The D/O requires that monitoring stations be placed at a minimum of five locations, one station each within Hawaiian Acres Subdivision, Waikahekahe Iki, Kaohe Homesteads, Upper Kaimu Communities, and along the southern border of the Kilauea Middle East Rift Geothermal Resource Subzone (KMERGRS), and other locations as required by DLNR.

b. The monitoring program shall provide for the installation, calibration, maintenance and operation of recording instruments to monitor hydrogen sulfide (H_2S), sulfur dioxide, mercury, radon and other elements and emissions as may be determined by DLNR.

c. Applicant shall submit to DLNR for ministerial approval, an Air Quality Monitoring program to be implemented when the well drilling period begins and shall continue through the term of the project.

Staff's Position

Staff concurs and recommends approval of the applicant's proposed modification to the air quality monitoring plan for the phase of work related to the drilling and flow-testing of exploratory wells, based upon the logic of monitoring air quality down-wind of each exploratory well for the temporary period of drilling and testing, as approved by the Department of Health. We interpret that the D/O requirement for five permanent monitoring stations around the perimeter of the property was intended to be required when geothermal production is to occur. Approval of the proposed monitoring plan is limited to the drilling and flow-testing of exploratory wells.

NOISE MONITORING PLAN

(4) Applicant's Request and Comments

Applicant proposes the following:

a. Applicant proposes the use of sound-propagation models (instead of simulating sound levels at each well site) to predict noise levels at downwind locations (receptors) nearest the project site.

b. Applicant proposes (based on plans to begin exploratory drilling at drill site A1) to conduct sound monitoring at two, instead of five, areas, Kaohe Homesteads and Upper Kaimu Homesteads, which are the two residential areas nearest the project boundary.

Applicant states the following:

a. Short-term measurements of a simulated-sound source under the existing meteorological conditions that exist when the measurements are made are not likely to represent the actual operating noises of the project equipment. Also, it is improbable that short-term noise simulation

testing would be representative of all, including adverse, meteorological conditions that may occur at the project site at the time of testing.

b. Noise monitoring must occur when all project systems are operating simultaneously in their normal mode with noise abatement equipment installed and over a period of time when adverse meteorological conditions would occur.

c. As long as exploratory drilling occurs in the Northeastern portion of the subzone, applicant believes that the two sound-receptor locations at nearby Kaohe Homesteads and Upper Kaimu Community will adequately and accurately provide an indication of the maximum audible project noise sound levels that could be propagated into any surrounding community.

d. As authorized by the D/O, a mobile sound monitoring unit will be used. This will enable the operator to monitor noise levels at any of the nearby residences when requested or when a noise complaint is received. Alternate monitoring sites will be selected as may be necessary when new project sites are occupied or if noise complaints are received from any resident near the project.

D/O Conditions

a. Noise monitoring program must be implemented prior to exploratory well drilling and testing period and subject to ministerial approval by DLNR.

b. Program must include an evaluation of predicted noise levels for selected sites in the residential areas near the proposed drilling and testing operations.

The program must simulate actual sounds levels at each proposed well site and measure noise levels at selected sites. The noise evaluations shall be submitted to DLNR for ministerial approval prior to approval of permission to drill at each site.

c. The number and location of on-site and off-site monitoring stations shall be subject to the determination of DLNR. Mobile stations may be used.

d. The noise level monitoring and standards shall be applied to receptors located at a minimum of five stations, similar to those as specified by the air quality monitoring requirements of the D/O, and shall be in operation during the term of the project.

e. Lastly, the D/O provides that the above guidelines may be administratively adjusted by DLNR based on information derived in the initial phase or phases of the project in order to address activities subsequent to such phases.

Staff's Position

Applicant's request to use sound propagation models prepared by Darby & Associates, Inc., acoustical consultants, Kailua, Hawaii, in lieu of onsite simulated noise testing is acceptable and satisfactory to staff, based upon its experience in regulating similar geothermal well drilling. In the past, actual noise monitoring around geothermal drill rigs during operation has always proved satisfactory. Furthermore, standard construction methods are available to attenuate the noise of drill rig operations to acceptable levels, and State and County noise standards.

Applicant's request to establish two, instead of five, noise-monitoring sites at the nearest residential homesites (Kaohe Homesteads and Upper Kaimu Homesteads) is deemed to be adequate and satisfactory by staff. These two sites are the nearest residences to the first drill site (site A-1) and, therefore, the likeliest people to be affected. The five sites required by the D/O at the perimeter of the overall project area is believed to relate to the time when geothermal development production actually occurs.

CONCLUSIONS

Based on staff's analysis of the Applicant's requested changes and rationale in support of the proposed modifications, our Division of Water and land Development recommends approval of the submitted Environmental Monitoring Plans and Programs for geothermal exploration activities. Staff's position is that the modifications are acceptable and may be ministerially approved as provided by the conditions of the D/O.

This approval of the requested D/O modifications shall apply to the first and subsequent wells; provided, however, that the approved modifications shall continue to be in effect for subsequent wells, only if a review of all the data on abated venting, unabated venting, air quality/meteorological monitoring, and noise monitoring can show that all applicable rules and regulations and conditions of the D/O regarding the above stated activity have been complied with during the initial phase.

MANABU TAGOMORI

Enc.

REF:WL-KO

MAY 30 1989

Mr. H.A. True, III
True Geothermal Energy Company
P.O. Box 2360
Casper, Wyoming 82602

Dear Mr. True:

This letter is to advise you that the Department of Land and Natural Resources has approved the following items: (1) Plan of Operations, (2) Request for Modifications, and (3) Environmental Monitoring Plans and Programs as required pursuant to the Board of Land and Natural Resources' Decision and Order dated April 11, 1986. Please note the specific conditions which are outlined below under which these approvals are granted.

PLAN OF OPERATIONS

Transmitted for your information and files is a copy of the Land Board Submittal concerning the Plan of Operations for True/Mid-Pacific Geothermal Venture, which was approved by the Board of Land and Natural Resources at its meeting on March 23, 1989.

All work shall be performed in accordance with the permission and terms of the occupier of the land, the Drilling and Completion Procedures approved by the Department, the Department's Administrative Rules (Chapters 13-183 and 13-184), and all other applicable Federal, State, and County laws, ordinances, rules and regulations.

REQUEST FOR MODIFICATIONS

Your request for modifications to specific conditions set forth in the Land Board's Decision and Order (D/O) dated April 11, 1986, for the initial phases of exploration activity and drilling of True/Mid-Pacific Well A1-1, is hereby approved as described in the attached staff report.

This approval of the requested D/O modifications shall apply to the first and subsequent wells, provided however, that the approved modifications shall continue to be in effect for subsequent wells, only if

a review of all the data on abated venting, unabated venting, air quality/meteorological monitoring, and noise monitoring can show that all applicable rules and regulations, and conditions of the D/O regarding the above stated activity have been complied with during the initial phase.

Any further request to modify the conditions of the D/O relating to additional wells during subsequent phases of your geothermal exploration/development activities must be submitted separately for consideration at that time.

ENVIRONMENTAL MONITORING PLANS AND PROGRAMS

The Department hereby approves the following plans and programs as submitted pursuant to the Board's D/O:

Management Plan. It is requested that continued efforts be made to avoid endangering any Threatened and Endangered Species of plants and wildlife during exploratory activities.

Biological Survey. It is recommended that clearing of forested areas, in which nests of endangered species are sighted, shall be conducted in such a manner so as to prevent destruction or disruption during the nesting months of February through June. Standing water open to mosquito infestation should be treated or backfilled to prevent bird disease vectors.

Archaeological Survey. As a follow-up condition to the approval of the submitted archaeological survey related to clearing operations, the applicant shall prepare an archaeological research design to guide all future archaeological work within the project area, which shall be submitted to the Department for ministerial approval, prior to the commencement of any clearing activity. If any unanticipated sites or remains of historic or prehistoric interest (such as shell, bone, or charcoal deposits, human burials, rock or coral alignments, paving, or walls) are encountered during the operation, the applicant shall stop work and contact the Historic Preservation Office at 548-7460 or 548-6408 immediately.

Emergency Plan. The plan as submitted has been reviewed and approved by the Hawaii County Civil Defense Agency and meets the requirements for a plan of action during emergency situations.

True/Mid Pacific Geothermal Venture (Applicant) shall continue to observe and comply with all valid requirements of County, State, and Federal authorities and regulations, in addition to any other conditions set forth in the Land Board's D/O.

MAY 30 1989

If there are any contemplated changes in the proposed exploratory activities, the Applicant shall obtain the Chairperson's approval prior to the execution of any such contemplated changes of work. In addition, the Applicant shall notify the Department, in writing, of the date of start of work for any of the approved activities.

Should you have any questions concerning the above approvals and/or attached conditions, please contact Manabu Tagomori at (808) 548-7533.

Very truly yours,

WILLIAM W. PATY

Attach.
cc: Mr. Allan Kawada,
True Geothermal Energy Co.
Mr. Rod Moss,
Mid-Pacific Geothermal, Inc.

1/23/90
For Future Reference

modify1(draft3/6/89)

MEMORANDUM

TO: Warren Price III
etc.

ATTN: Johnson Wong, etc.

FROM: William W. Paty, etc.

SUBJECT: True/Mid-Pacific Venture's Request for Modification to the Conditions set forth in the Board of Land and Natural Resources' Decision and Order dated June 18, 1986, (CDUA No. HA-12/20/85-1830)

The Board of Land and Natural Resources (BLNR) in its Decision and Order (D/O) dated April 18, 1986, authorized the exploration and development of geothermal resources on Campbell Estate land (TMK:1-2-10:3), located in the Puna District, Island of Hawaii.

The D/O set forth procedures and conditions related to geothermal development activities such as, but not limited to, abated venting of geothermal wells and air quality/noise monitoring plans and programs, which were to be submitted to the Department of Land and Natural Resources (DLNR) for ministerial approval prior to implementation.

True/Mid-Pacific Venture (Applicant) has submitted to the Department for Chairperson's approval, a request to modify (3) specific conditions prescribed by the BLNR in its D/O. The original conditions set forth by the BLNR and the Applicant's requested modifications to those conditions are outlined below:

ABATED VENTING

Decision and Order Conditions:

1) Abated venting of geothermal wells may take place only between 9 a.m. to 6 p.m., Monday through Friday, exclusive of Holidays, and not longer than a continuous 8 hour period.

2) With specific reference to abated venting, the D/O states that "for good cause shown and when no reasonable alternatives exist, the Department may modify these restrictions", (i.e. the 8 hour venting limitations).

3) The D/O further states that "unabated open venting of geothermal emissions is prohibited except by prior written permission of DLNR or in emergency situations".

Applicant's Proposed Modifications:

1) Applicant proposes continuous (abated) flow testing of each geothermal well for a period of 30 to 45 days. Applicant states that this is standard industry practice for well testing and reservoir analysis and will reduce the possibility of thermal shock and damage to the well casing and cemented annulus which may result due to periodic (on-off) shutting down of the well. Also, the need for continuous flow testing is critical in order to avoid the interruption and change in flow rates during flow test measurements.

   Applicant further states that "there is no reasonable alternative known to be feasible in the geothermal industry that would allow reservoir analysis to the degree of accuracy that is necessary to justify the commitment and expenditure of millions of dollars for a power plant to utilize the resource".

2) Applicant also, requests approval to conduct open (unabated) venting of each well, for a maximum period of 8 hours. Per the applicant, only one well will be open vented at any given time.

AIR QUALITY MONITORING

Decision and Order Conditions:

1) Applicant shall submit to DLNR for ministerial approval, an Air Quality Monitoring program to be implemented when the well drilling period begins and shall continue through the term of the project.

2) The monitoring program shall provide for the installation, calibration, maintenance and operation of recording instruments to monitor hydrogen sulfide (H2S), sulfur dioxide, mercury, radon and other elements and emissions as may be determined by DLNR.

3) The D/O requires that monitoring stations be placed at a minimum of 5 locations, (1) station each within Hawaiian Acres Subdivision, Waikahekahe Iki, Kaohe Homesteads, Upper Kaimu Communities, and along the southern border of the Kilauea Middle East Rift Geothermal Resource Subzone (KMERGRS) and other locations as required by DLNR.

4) The Applicant is required to meet all Federal, State, and County air quality guidelines and regulations, and where appropriate, U.S. EPA guidelines and protocol will be followed and standard U.S. EPA quality assurance documentation shall be provided for the monitoring program.

5) The D/O provides that the air quality plan and program shall be modified as deemed necessary by DLNR based on information derived in the initial phase or phases of the project in order to address activities to be undertaken subsequent to such initial phases.

Applicant's Proposed Modifications:

1) The Applicant states that the air quality monitoring conditions set forth by the BLNR's D/O addresses monitoring requirements for both exploration and production phases of the project.

2) The proposed monitoring plans as submitted, are directed at the exploration phase of the project and as such, should not be required to meet all the D/O conditions, some of which are more specifically related to production activities.

3) The Applicant states that the air quality monitoring proposed for the initial increment of exploration will measure the air quality in the area of maximum estimated impacts due to emissions from drilling, venting and flow testing of exploratory wells.

4) Furthermore, the Applicant states that geothermal wells do not meet EPA criteria of major permanent sources of emissions. Thus, the emissions from well drilling, venting and testing during operations as part of any operating power plant, are not large enough to constitute a major source and, therefore, are not subject to EPA PSD review requirements.

5) Selecting the correct locations for a monitoring station for an area with multiple permanent emission points will be more applicable for the project during the production stage. However, for the proposed initial exploration phase, there will be only one temporary source (except for volcanic emissions) emitting at any one time during drilling and testing of wells.

6) There will only be one well open (unabated) venting at any given time and then only for a maximun of 8 hours. After venting, each well will be flow tested (abated) for 30 -45 days continuous, using appropriate pollution and noise abatement systems.

7) Applicant proposes the following program in lieu of the D/O prescribed conditions:

   a) Operation of a meteorological monitoring station located at the drill site.
   b) Use of a mobile monitoring van downwind of the drill site. The mobile monitoring van will be located as close as possible to the maximum estimated impact area for each drill site.
   c) Passive H2S monitors will be operated at a radius of approximately 3,000 feet in the primary downwind direction from each drill site.
   d) The mobile monitoring station will monitor air quality and meteorological conditions for a minimum of one week before emissions commence from the well being drilled and continued during drilling, venting and testing.
   e) That the monitoring program described above is consistent with EPA protocol and guidelines and the nature of the incremental geothermal exploration and development activities authorized in the project area.

8) While the D/O required the Applicant to submit the proposed air quality monitoring plan to DLNR for ministerial approval prior to drilling, it is the Department of Health (DOH) who has the responsibility to implement and enforce the regulations for the EPA air quality programs in Hawaii, including the monitoring requirements.

9) As such, the Applicant has submitted the proposed monitoring plans and programs to the DOH for approval. Applicant has indicated that the DOH has no major objections to the plans as proposed, however, our Department has not received any memorandum to date from DOH confirming their concurrence with Applicant's monitoring plans.

NOISE MONITORING PLAN

Decision and Order Conditions:

1) Noise monitoring program to be implemented prior to exploratory well drilling and testing period subject to ministerial approval of such plans by DLNR.

2) The noise monitoring program shall include an evaluation of predicted noise levels for selected sites in the residential areas near the proposed drilling and testing operations.

   The program shall simulate actual sounds levels at each proposed well site and measure noise levels at selected sites. The noise evaluations shall be submitted to DLNR for ministerial approval prior to approval of permission to drill at each site.

3) The number and location of on-site and off-site monitoring stations shall be subject to the determination of DLNR. Mobile stations may be used.

4) The noise level monitoring and standards shall be applied at receptors located at a minimum of (5) stations, similar to those as specified by the air quality monitoring requirements of the D/O, and shall be in operation during the term of the project.

5) Lastly, the D/O provides that the above guidelines shall be enforced and may be administratively adjusted by DLNR based on information derived in the initial phase of phases of the project in order to address activities to undertaken subsequent to such initial phases.

Applicant's Proposed Modifications:

1) The applicant states that short term measurements of an artificial or simulated sound source under the meteorological conditions that exist when the measurements are made are not likely to represent the actual noises of the project equipment in their operating configuration (with sound attenuation equipment installed) and locations within a cleared drilling site.

2) It is improbable that the existing meteorological conditions during short term noise simulation testing would constitute representative adverse meteorological conditions for the project site.

3) Applicant states that monitoring must occur when all project systems are operating simultaneously in their normal mode with attenuation devices installed and when meteorological conditions would enhance sound propagation in the direction of the nearest residential receptors.

4) As such, Applicant proposes the use of sound propagation models to predict noise levels at downwind receptors nearest the project site assuming (1) a base level of noise attenuation systems being applied to project equipment to limit noise to a specific level at 100 feet and (2) the prevalance of various types of weather conditions that would enhance the transmission of sound.

5) Based on plans to begin exploration drilling at drill site A1, it is proposed that sound monitoring for the first well be conducted at the residential areas (receptors) nearest the project boundary with the potential to experience noise levels in excess of the county guidelines. These (2) areas are Kaohe Homesteads and Upper Kaimu Community.

6) As long as as exploration drilling remains in the Northeastern portion of the subzone, Applicant believes that (2) residential sound receptor locations will be adequate to provide an accurate indication of the maximum audible project noise sound levels that could be propagated into any surrounding community.

7) As authorized by the D/O, a mobile sound monitoring unit will be used. This will enable the operator to monitor noise levels at any of the nearby residences when requested or when a noise complaint is received. Alternate monitoring sites will be selected as may be necessary when new project sites are occupied or if noise complaints are received from any resident near the project.

SUMMARY

Pursuant to the D/O, the Applicant has submitted the above summarized plans and programs to the Department for ministerial approval prior to their implementation. In conjunction with their request for approval, Applicant has proposed certain modifications to the D/O which directly relate to the conditions set forth for each plan by the D/O.

The Department has no objections to the Applicant's requested modifications and concurs with the rationale in requesting for such changes to the D/O conditions. With specific reference to the item of Abated Venting, it is our position that such modifications are appropriate and as such may be ministerially approved by DLNR on the basis that no other reasonable alternative exists for the Applicant.

With respect to the Air Quality and Noise Monitoring programs, modifications may be approved by DLNR based on information derived in the initial phase of the project. While there has been no data directly generated from any initial phase of exploration activity, the evidence presented by the Applicant in support of their request, provides an adequate and acceptable basis for ministerial approval of such modifications.

CONCLUSION

It is the Department's position that the modifications as proposed, are clearly meant to be administered at the Departmental level for ministerial approval. We strongly believe and feel that the language contained in the D/O supports our position, that reasonable changes or modifications to the prescribed conditions in the D/O are allowable and may be approved without the necessity of reopening the public hearing/contested hearing process again.

The Department therefore proposes to ministerially approve the Applicant's requested modifications to the conditions of the BLNR's D/O. However, pursuant to the nature of the proposed modifications, we query whether the Board of Land and Natural Resources must take formal action in approving such requests, or can the Chairperson on behalf of the Department, administratively approve the requested modifications?

We respectfully request your review of the matter and any comments as to your concurrence with our assessment and processing of the requested modifications proposed by the Applicant. Your timely response will be greatly appreciated. Should you have any questions, please contact Manabu Tagomori at Ext. 7533. Thank you for your continued assistance and cooperation.

WILLIAM W. PATY

II. BACKGROUND

To understand the context in which this application arises, it is necessary to briefly review the history of the applicant's geothermal proposals. On March 2, 1982, the Estate of James Campbell filed a Conservation District Use Application (CDUA) with the Department of Land and Natural Resources to develop geothermal resources at Kahauale'a, Hawaii. This CDUA, No. HA-3/2/82-1463, was processed and a draft Environmental Impact Statement prepared. On May 20, 1982 a petition for a contested case hearing on the CDUA was filed. The petition was granted. The contested case hearing was convened on October 5, 1982, and continued on October 25 through 29, 1982, November 15 through 19, 1982, and December 7 through 10, 1982.

The Board of Land and Natural Resources (BLNR) made extensive findings of fact, issued a conclusions of law, and decision and order dated February 25, 1983, granting the Estate of James Campbell limited exploration rights within a designated area of 800 acres located at Kahauale'a, Puna, Hawaii.

Subsequent to the BLNR's February 28, 1983 decision and order, the Hawaii State Legislature passed Act 296, SLH 1983, delegating to the BLNR the responsibility of designating geothermal resource subzones throughout the State of Hawaii by selecting those areas that best demonstrate an acceptable balance among seven criteria now codified in HRS 205-5.2.

Pursuant to Act 296, SLH 1983, the Chairperson of the BLNR assigned the Division of Water and Land Development (DOWALD), of the Department of Land and Natural Resources (DLNR) the task of assessing and recommending

geothermal resource subzones (GRS). DOWALD began work on the assessment of potential geothermal resource subzones on June 14, 1983, when Act 296, SLH 1983 was signed into law.

In 1984, the Legislature passed Act 151. This act gave first priority to the assessment of the Kahauale'a area as a potential geothermal resource subzone and required the BLNR to act on the designation of the Kahauale'a area by December 31, 1984. DOWALD assessed the Kahauale'a area and proposed a 5300-acre area for designation as a GRS.

Public information meetings and public hearings were held as part of the subzone designation process. At the public hearing held on September 12, 1984 in Hilo, Hawaii, requests for a contested case hearing on the proposed Kahauale'a GRS, were made to the BLNR and subsequently granted. The BLNR conducted the contested case hearing on December 12-20, 1984 in Hilo, Hawaii and issued its decision and order on December 28, 1984.

In the December 28, 1984 decision and order, the BLNR designated the 800-acre area described in its February 25, 1983 decision and order as a geothermal resource subzone under the following conditions upon:

(1) Cessation of volcanic activity in, around and near the area permitted by the Board's February 25, 1983 decision and order.

(2) No new geothermal development activity associated with the permitted area shall be considered until after it has been determined that the geologically hazardous and eruptive activity has ceased.

(3) The Board formally requested the Estate of James Campbell to investigate and consider a land exchange involving State-owned lands in the Kilauea Middle East Rift Zone and Campbell Estate's lands at Kahauale'a.

(4) The BLNR further resolved to consider the Kilauea Middle East Rift Zone for designation as a GRS on the basis of information presented at the contested case hearing which indicated that Campbell's Kahauale'a

property contained higher quality native habitat than the Wao Kele 'O Puna Natural Area Reserve (NAR).

(5) The Board directed the Division of Water and Land Development to assess the Kilauea Middle East Rift Zone in and adjacent to the Wao Kele 'O Puna Natural Area Reserve beginning on the western boundary of the existing Kamaili GRS. This area had not previously been evaluated as a GRS because of its classification as a Natural Area Reserve. Conversely, the privately owned Kahauale'a lands had not been previously considered as a natural area reserve because under State law, natural area reserves may only be on State land.

(6) The decision further stated that if (a) the assessment of the Kilauea Middle East Rift Zone does not result in a designation as a geothermal resource subzone, or (b) a land exchange between the State of Hawaii and the Estate of James Campbell is not consummated, then the remainder of the 5300 acre Kahauale'a area originally proposed by DOWALD for designation as a GRS, shall be designated as a GRS.

(7) The Board urged the federal government and the National Park Service (NPS) to seek acquisition of Tract 22 (described in the Volcanoes National Park Master Plan), which the State will not itself seek, but which is desired by the NPS for addition to the Volcanoes National Park.

(8) Finally, the decision provided that "...if the State of Hawaii and Campbell Estate should later consummate a land exchange involving lands at Kahauale'a for State or other lands upon which geothermal activities may take place, then the geothermal subzone designation in this Decision and Order shall cease to exist and shall have no force or effect in law..."

Pursuant to the decision and order of December 28, 1984, DOWALD conducted an assessment of the Kilauea Middle East Rift Zone in and adjacent to the Wao Kele 'O Puna NAR for a geothermal resource subzone, using the same criteria set forth in Act 296, SLH 1983.

The assessment of the Kilauea Middle East Rift Zone is outlined in the DOWALD Circular C-114 (State Ex. 2, G.S. No. 9/26/85-5) and in the proposal to designate the area as a GRS (State Ex. 1, G.S. No. 9/26/85-5).

The BLNR held a public hearing on the proposed designation of the Kilauea Middle East Rift as a geothermal resource subzone on September 26, 1985, and at that time, a request for a contested case hearing was made to the BLNR.

On October 16, 1985 the BLNR announced that a contested case hearing would be held on the proposed GRS designation on November 13, 1985, in Hilo, Hawaii. On November 13, 14, and 15, 1985, the BLNR conducted a contested case hearing on the proposed designation of 11,745 acres in the Kilauea Middle East Rift zone as a geothermal resource subzone. On December 20, 1985, the Board issued a decision and order designating approximately 9,014 acres of the Wao Kele 'O Puna area as a GRS. On April 9, 1986, the Board issued its findings of fact, conclusions of law and revised decision and order.

III. LAND USE PROPOSAL

1. Subject

FINDINGS OF FACT, CONCLUSIONS OF LAW , AND DECISION AND ORDER on the Conservation District Use Application (CDUA) No. HA-12/20/85-1830 for exploration, development and production of 100 MW of geothermal energy resources, at Kilauea Middle East Rift Geothermal Resource Subzone (KMER/GRS), Puna, Hawaii.

2. Applicant

Mr. O. K. Stender
Chief Executive Officer
The Estate of James Campbell
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 96813

3. Landownership

The Estate of James Campbell claims the fee ownership of the property subject to the State of Hawaii's reservation of all mineral and metallic mines including all geothermal resources and the reservation of the rights of tenants as contained in the exchange deed with the State of Hawaii dated December 27, 1985.

4. Location

The land is located in the southern portion of the applicant's property at TMK 1-2-10:3 in the Kilauea Middle East Rift Geothermal Resource Subzone, Puna, Hawaii.

5. Description of Area

According to the Decision and Order issued by the BLNR on Dec. 20, 1985, the KMER/GRS contains approximately 9,014 acres, more or less. The KMER/GRS is located within TMK No. 1-2-10, portions of Parcels 1 & 3 (Conservation District Subzone code P), TMK No. 1-2-8, portions of Parcels 8, 12, 13, 16, & 17 (Agricultural District) and TMK 1-2-8 Parcels 16 & 17 (Agricultural District). The Applicant's property is located entirely within the former Wao Kele 'O Puna Natural Area Reserve, TMK No. 1-2-10 Parcel 3.

The KMER/GRS is bordered: on the west by Kahauale'a which is the subject of another Conservation District Use Permit (CDUA File No. HA-3/2/82-1463), granting the Applicant the right to explore for geothermal resources to produce electrical power; on the north by the former Puna Forest Reserve and a portion of the former Wao Kele 'O Puna Natural Area Reserve; on the east by adjoining agricultural parcels containing scattered residences from which there is a 2,500 feet setback from the property line of the Kaohe Homesteads; on the southeast by state-owned property and a part of the upper Kaimu Homesteads; and on the south by part of the upper Kaimu Homesteads, the Kaimu-Makena Homesteads, Kauka Homesteads, Kihale-Keonea Homesteads and the Kupahua Homesteads.

6. Area of Subzone/Use

The KMER/GRS contains approximately 9,014 acres, more or less. Of that area, it has been proposed that approximately 244-304 acres may potentially be used for this project. Of this total, approximately 244 acres will be directly affected by clearing and/or construction.

7. Subzone

The KMER/GRS is designated as Conservation of the State Land Use classification. It is classified as a Protective Subzone of Conservation District and as a geothermal resource subzone.

8. Current Use

According to the EIS and public testimony, the land is currently in its natural state, essentially vacant. The area is mostly forested. The vegetation ranges from high quality native vegetation, (wet 'ohi'a forest with dense 80% canopy) to lower quality vegetation and open areas devastated by lava flows in and below the rift zone.

9. Proposed Use

The Applicant requests permission to use the land within KMER/GRS to explore for, develop and produce up to 100 MW of geothermal energy. The Applicant's proposed uses are summarized from the Environmental Impact Statement (EIS) as follows:

Proposed Exploration

The initial objectives of this project are to prove the existence of a geothermal resource, its characteristics, and whether it can be economically produced. Subsequent exploration and development, in parallel with additional market development, will help determine the extent of the producible resource underlying the KMER/GRS, the rate of development and whether the planned scope of the project can be realized. The Applicant proposes to develop up to 100 MW of electrical

first 25 MW of power are expected to parallel the proposed access roads and existing off-site roads. Routes for transmission lines for the larger power requirements (138 KV) for use on the Big Island or for export via undersea cable cannot be determined until the extent and location of geothermal power resources and users are known. Drilling operations will be conducted by the operator, True Geothermal Energy Company. It is anticipated that most construction operations will be contracted through local companies. Traffic into the KMER/GRS parcel will be controlled by a gate at the entrance together with such safety and security patrol activity as may be required for the drilling and construction operations within the property. The landowner and developer will cooperatively institute a security management plan to provide for orderly control of project activities and monitoring activities necessitated by opening a road into this parcel.

Proposed Marketing

Although marketing of natural resource is not in itself a question normally considered as a land use variable, in this instance the applicant has proposed marketing the planned electricity produced at KMER/GRS to the HELCO electrical distribution grid.

According to the applicant, and based on the most optimistic scenario of commencing the initial drilling on July 1, 1986, the first 12.5 MW of power will be on-line around March 1, 1989 and the final 75 MW should be on-line during 1995.

10. Chronology

The following is a brief chronological summary of the major events in the application process, EIS process, public hearing process, and the contested case process. It is not meant to be complete and all inclusive.

January 13, 1983

In his closing argument, Mr. Kenneth Kupchak, attorney representing Volcano Community Association at the contested case hearing for the CDUA

for geothermal exploration and development at Kahauale'a, strongly urged the Board that a land exchange be considered as a resolution to the conflict between his client and the applicant. The land exchange suggested included the exchange between the Estate of James Campbell, landowner of Kahauale'a, and the State of Hawaii, landowner of the Puna Forest Reserve and the Wao Kele 'O Puna Natural Area Reserve.

July 6, 1985

The DLNR filed an EIS preparation notice with the Office of Environmental quality Control (OEQC) in accordance with Sections 11-200-15 and 11-200-26 through 11-200-29 of the Environmental Impact Statement regulations. The filing allowed the applicant to prepare a supplemental EIS for the geothermal project within the proposed KMER/GRS as a continuation of the Kahauale'a project.

July 23, 1985

The OEQC published the preparation notice for the Supplemental EIS for the Geothermal Project within the proposed KMER/GRS in Puna, Hawaii in the OEQC Bulletin.

August 20, 1985

A Conservation District Use Application was filed with the DLNR to explore for and develop geothermal energy within the proposed KMER/GRS.

December 19, 1985

The applicant filed the draft supplemental EIS with the DLNR and OEQC.

December 20, 1985

The BLNR issued its Decision and Order on the designation of the KMER/GRS with the Findings of Facts and Conclusions of Law to be issued separately.

December 23, 1985

The OEQC published the notice of the filing of the draft supplemental EIS. The EIS was available for comment.

December 24, 1985

The BLNR announced that a public hearing for the CDUA would be held.

December 27, 1985

The exchange deeds between the Estate of James Campbell and the State of Hawaii for Kahauale'a and the Puna Forest Reserve including the Wao Kele 'O Puna Natural Area Reserve was executed.

January 3, 1986

The DLNR issued the notice to the applicant accepting the application and had also determined that an Environmental Impact Statement must be prepared.

January 13, 1986

At the public hearing on the application, requests were made for a contested case hearing.

January 24, 1986

The BLNR announced that a contested case hearing would be held for the application.

February 6, 1986

The applicant filed with the BLNR the Final Supplemental Environmental Impact Statement.

February 14, 1986

The BLNR found the Final Supplemental EIS was adequate and had met the requirements of an EIS as specified in the EIS Regulations.

February 18, 1986 through February 23, 1986

The contested case hearing convened. Parties admitted to the hearing were: Applicant, County of Hawaii, Sierra Club - Hawaii, Susan Carey, Debra Hopson, Eva Lee, Chiu Leong, Ann Markham, Mike Markham, Beverly McCallum, Diane Ley, Lehua Lopez, Dr. Emmett Aluli (intervenor), Pulikapu O Kamohoali'i Dedman (intervenor), Mark and Lisa Heuer, Dan and Carla St. John, Michael and Sunny LaPlante, Rick Warshauer, Mae Mull, Karl Kirkendall and Melissa Kirkendall. The hearings were conducted in the morning, afternoon and evenings.

March 14, 1986

The hearing reconvened at the State Office Building Conference Rooms in Hilo, Hawaii.

March 21, 1986

Parties filed their proposed Findings of Fact, Conclusions of Law, and Decisions and Order.

April 11, 1986

The DLNR issued the Decision and Order on the Conservation District Use Application with the Finding of Fact and Conclusions of Law to be issued separately.

IV. FINDINGS OF FACT

The Board of Land and Natural Resources makes the following Findings of Fact. These findings of facts are organized for convenience and clarity in accordance with the factors identified in HRS 205-5.2 and Campbell Estate's application. The Board incorporates by reference all of the record in each of the previous proceedings related to Campbell Estate's geothermal development applications and GRS designations:

1. Kahauale'a CDUA, file No. HA-3/2/82-1463
2. Kahauale'a Subzone designation, file No. 8/27/84-1
3. Kilauea Middle East Rift Subzone designation, file No. 9/26/85-5

Revised 10/24/90

(BULLET)

BACKGROUND AND STATUS OF TRUE/MID-PACIFIC GEOTHERMAL VENTURE

- o March 1982 — CDUA filed by Campbell Estate to develop geothermal resources at Kahaualea, Hawaii
- o May 1982 — Petition for Contested case hearing on CDUA filed with the BLNR
- o July 30,1982 — Kahaualea Geothermal Project Final EIS accepted by the Board of Land and Natural Resources
- o October - December 1982 — BLNR conducted contested case hearing (total 14 days)
- o February 1983 — BLNR issues Decision and Order granting exploration rights within a designated 800 acre area within Kahaualea
- o June 1983 — Act 296, SLH 1983, (Chap. 205-5.2, HRS) passed by the Legislature, authorizing the BLNR to designate GRS statewide
- o May 1984 — Act 151, SLH 1984, passed by the Legislature, gave priority to the assessment of Kahaualea as a potential GRS, and mandated the BLNR to act on such designation by 12/31/84

  (Act 151, also "grandfathered" (3) existing geothermal resource mining leases as GRS)

  Public informational meetings held on the proposed designation of 5,300 acres of Kahaualea as a GRS
- o September 1984 — Public Hearings held on the proposed Kahaualea GRS, at which time requests for contested case hearing were received by the BLNR
- o December 1984 — BLNR conducted contested case hearing (total 9 days)

  Decision and Order (D/O) issued by the BLNR designating the 800 acre area identified in the February 1983 D/O as a GRS subject to the following conditions:

  1) Cessation of volcanic activity near the area

2) No new activity until eruptions cease

3) Campbell Estate investigate and consider a land exchange involving State owned lands in the Kilauea Middle East Rift Zone (KMERZ)

4) BLNR assess the KMERZ for designation as a GRS on basis of information received during the contested case hearing

5) BLNR direct DOWALD to assess the KMERZ area in and adjacent to the Wao Kele 'O Puna Natural Area Reserve beginning on the Western boundary of the existing Kamaili GRS

6) That if the KMERZ is not designated as a GRS or if the land exchange is not consumated, then the 5,300 acre Kahaualea area originally proposed by the BLNR, be designated as a GRS

7) That if the land exchange is consumated, the BLNR urge the Federal government and the National Park Service to aquire Tract 22

8) Lastly, if the land exchange is consumated and involves State or other lands upon which geothermal activities may take place, then the GRS designated (5,300 acres) in this D/O shall be eliminated

o January 1985 DLNR began assessment of KMERZ area as a GRS using the following criteria set forth in Act 296:

a) Objectives of the Hawaii State Planning Act, Chapter 226, HRS

b) Provision for designation in LUC Districts

c) EIS not required for the assessment of areas

d) Area's potential for geothermal resources

e) Prospects for utilization of geothermal energy

f) Social and environmental impacts

g) Compatibilty with existing land uses

h) Potential economic benefits to be derived from geothermal development

- o January 1985 — This assessment is outlined in DOWALD Circular C-114, and resulted in the proposal by the BLNR to designate 11,754 acres of the KMERZ area as a GRS

- o March 1985 — Public informational meetings on the proposed KMERZ GRS held on the island of Hawaii

- o August 1985 — CDUA filed with the BLNR to explore and develop geothermal resources in the proposed KMERZ GRS

- o September 1985 — Public hearing held on the proposed GRS designation, at which time a request for contested case hearing was made to the BLNR

- o November 1985 — BLNR conducted contested case hearing (total 3 days)

- o December 1985 — Decision and Order issued by BLNR designating 9,014 acres of the Wao Kele 'O Puna area as a GRS

  True/Mid-Pacific's draft supplemental EIS filed with DLNR and OEQC

  Land exchange deeds between Campbell Estate and the State of Hawaii were executed

- o January 1986 — Public hearing on Campbell Estate/True/Mid-Pacific's CDUA held by the BLNR, at which time requests were made for contested case hearing

- o February 1986 — Final Supplemental EIS to the Kahaualea EIS filed with the BLNR. (Note: Under Chapter 343, HRS, a Supplemental EIS is required if there is any major change in the action proposed in the EIS, including especially the size, scope, location and timing, which could result in new or different environmental impacts than originally predicted.) Pursuant to Chapter 343, the BLNR determined that as a result of relocating the proposed project, a SUP EIS would be required.

  BLNR conducted contested case hearing (total 5 days)

- o Feb. 14, 1986 — Final Supplemental EIS accepted by the Board of Land and Natural Resources

- o March 1986 — Contested case hearing reconvened (1 day)

- o April 1986 — Decision and Order issued by the BLNR approving geothermal exploration and development in the KMERZ GRS

- o July 1987 — Geothermal Resource Mining Lease R-5 (for 9,014 acres) issued by the BLNR to Campbell Estate/True-Mid-Pacific Geothermal Venture

- o February 1989 — Plan of Operations, Application for Permit to Drill, and Environmental Monitoring Plans and Programs submitted to DLNR by True/Mid-Pacific

- o March 1989 — BLNR approves True/Mid-Pacific's Plan of Operations

- o May 1989 — DLNR approves Environmental Monitoring Plans and Programs, and issues Geothermal Well Drilling Permit

- o June 1989 — DLNR approves True/Mid-Pacific's Archaeological Research and Design

  DLNR conducts inspection of grubbing and grading activity at True/Mid-Pacific well site (6/30/89)

- o July 1989 — DLNR issues Cease and Desist Order to Campbell Estate/True Geothermal in response to clearing and grubbing violations

- o August 1989 — BLNR fines True/Mid-Pacific Geothermal Venture $16,638

  Cease and Desist Order lifted by the BLNR

- o September 1989 — DOH issues Authority to Construct (ATC) Permit to True Geothermal for (12) wells

- o November 1989 — True Geothermal begins drilling of geothermal well True/Mid-Pacific A1-1 (11/18/89)

(Note: this chronology does not address the numerous lawsuits and appeals related to the project and/or land exchange)

1/20/90
Future Reference

(INDEX)

DOCUMENT INDEX FOR TRUE/MID-PACIFIC GEOTHERMAL VENTURE

FOLDER No. 1

Item No.	Date Rc'vd	Date of Letter/Memo	Subject/Remarks
1a			USGS Quad map showing T/M-P access road
1b			TMK map showing road
2a	2/6/89		Letter from True to Paty requesting approval of Plan of Operations
2b	2/6/89		Plan of Operations
3a	2/6/89		Letter from True to Paty requesting approval of Environmental Monitoring Plans & Programs
3b	2/6/89		Environmental Monitoring Plans and Programs
4	2/22/89		Letter from Paty to True acknowledging receipt of Plan of Operations, Environmental Monitoring Plans, and Well Drilling Permit Application
5	2/27/89		Letter from Kawada to DLNR transmitting $100 filing fee
6		2/1/89	Copy of letter from True to Kanuha transmitting Environ. Monitoring Plans
7		12/16/88	Copy of letter from True to Lewin requesting approval of ATC permit for wells, and transmittal of AirQuality/Meteorological Monitoring Plans
8a			Copy of DOH Public Notice requesting comments on draft ATC permit

DOCUMENT INDEX FOR TRUE/MID-PACIFIC GEOTHERMAL VENTURE

FOLDER No. 1

Item No.	Date Rc'vd	Date of Letter/Memo	Subject/Remarks
8b		1/30/89	Copy of letter from Aki (DOH) to True w/ comments on Air Quality and Meteorological Monitoring Plans
8c		2/17/89	Copy of letter from Aki to True approving Monitoring Plans
9		2/1/89	Copy of letter from True to Kim (Civil Defense) requesting approval of Emergency Plan
10	3/29/89		Letter form Kim to Nakano acknowleging approval of T/M-P Emergency Plan
11		2/16/89	Memo from Tagomori to Evans (OCEA) transmitting T/M-P request for modifications to D/O
12		2/16/89	Memo from Tagomori to all divisions requesting comments on Plan of Operations
13	4/14/89		Return of comments on Plan of Ops from Land Mgt
14	2/24/89		Memo from Sakuda to Tagomori re: Plan of Ops
15	3/17/89		Memo from Walker to Tagomori re: Plan of Ops
16	4/6/89		Memo from Nagata to Tagomori re: Plan of Ops
17	4/13/89		Memo from Nagata to Tagomori re: Plan of Ops and Archaeological Survey

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FOLDER No. 1

Item No.	Date Rc'vd	Date of Letter/Memo	Subject/Remarks
18		3/23/89	Board submittal approving T/M-P Plan of Ops
19		4/25/89	Memo from Tagomori to all divisions requesting comments on T/M-P Environmental Monitoring Plans and Programs
20	5/5/89		Return of comments on Environ. Monitoring Plans from Land Management
21	5/4/89		Memo from Evans to Tagomori re: Environ. Monitoring Plans
22	5/2/89		Memo from Sakuda to Tagomori re: Environmental Monitoring Plans
23	5/16/89		Return of comments on Environ. Monitoring Plans from Aqua. Develop. Program
24	5/11/89		Memo from Walker to Tagomori re: Environmental Monitoring Plans
25	5/19/89		Memo from Nagata to Tagomori re: Environmental Monitoring Plans and Archaeological Survey
26		5/23/89	Memo from Tagomori to Paty re: Staff analysis for T/M-P request for D/O modifications
27		5/30/89	Letter from Paty to True approving request for modifications

DOCUMENT INDEX FOR TRUE/MID-PACIFIC GEOTHERMAL VENTURE

FOLDER No. 1

Item No.	Date Rc'vd	Date of Letter/Memo	Subject/Remarks
28a	6/8/89		Arch. research design prepared by Archaeological Consultants of Hawaii for T/M-P
28b	6/8/89		Letter from Moss to Paty transmitting Arch. Research Design
29a	6/16/89		Revised Arch. Research Design
29b	6/16/89		Memo from Nagata to Tagomori re: revised Arch. Research Design
30		6/16/89	Letter from Paty to Moss approving Arch. Research Design
32			Memo for the Record from Nakano re: 6/30/89 inspection of T/MP drill site
33			Memo for the Record from Nakano re: Measurement of width of access road
35		7/10/89	Memo from Tagomori to Nuha requesting survey of T/MP drill site
36a		7/11/89	Notice and Order to cease and desist activity issued to Campbell, Kawada, and True
36b		7/17/89	Memo from Landgraf to Tagomori re: issuance of cease and desist order
37		8/1/89	Copy of letter from Weaver to True

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FOLDER No. 1

Item No.	Date Rc'vd	Date of Letter/Memo	Subject/Remarks
38		8/3/89	DLNR notification to Campbell, Kawada, and True of Board action re: violation
39	8/11/89		Letter from Dunn (CREDAA) to Paty
40			Photos of T/MP well site received from Olson
41		8/11/89	CEA Board submittal re: T/MP CDUA violation
42		8/14/89	Letter from Paty to Campbell, Kawada, and True re: violation and fine
43	8/16/89		Memo from Evans to Tagomori re: T/MP violation
44	8/25/89		Letter from Kawada to Paty re: Request for approval of amendments to Plan of Operations
45			Memo for the Record from Nakano re: 8/31/89 Site inspection of T/MP grading operations
46		9/5/89	Letter from Paty to Kawada approving amendments to the Plan of Ops
47			Memo from Nakano re: 9/20/89 Field inspection of T/MP grading operations (w/ photos)
48	9/22/89		Letters from Matsubara to Buck and Wakida (Forestry) re: payment for financial sanctions

DOCUMENT INDEX FOR TRUE/MID-PACIFIC GEOTHERMAL VENTURE

FOLDER No. 1

Item No.	Date Rc'vd	Date of Letter/Memo	Subject/Remarks
49	9/25/89		Treasury Deposit Receipt from Fiscal Office for $1,638.35 payment rc'vd
50			Memo for the Record from Nakano re: 9/27/89 Site inspection of T/MP grading operations
51	10/5/89		Letter from Nishida to Paty requesting approval of modifications to reservoir
52	10/11/89		Revised grading plan for reservoir pit from Okahara and Associates
53		10/16/89	Letter from Paty to Nishida approving modifications
53a	10/25/89		Letter from Nishida to Paty requesting approval of modifications to reservoir
53b		10/31/89	Letter from Paty to Nishida approving modifications

DOCUMENT INDEX FOR TRUE/MID-PACIFIC GEOTHERMAL VENTURE

FOLDER No. 2

Item No.	Date Rc'vd	Date of Letter/Memo	Subject/Remarks
54	10/13/89		Letter from True to Tagomori re: selection of Environ. Monitoring Consultant
55		10/24/89	Letter from Paty to True designating consultant
56	11/15/89		Copy of letter from Kawada to Aki (DOH) re: H2S abatement plan
57	11/13/89		Letter from True to Tagomori re: installation of security lighting
58		11/20/89	Letter from Tagomori to True acknowledging item 57
59	10/26/89		Letter from Kawada to Tagomori re: intention to designate 2nd drill site
60		11/20/89	Letter from Tagomori to Kawada acknowledging item 59
61	12/4/89		Letter from Moss to Tagomori submitting supplemental biological survey
62	12/4/89		Letter from Moss to Tagomori submitting follow-up archaeological survey
63			Approved Entry List for access into T/MP site
64	12/13/89		Letter from True to Tagomori re: noise monitoring data

DOCUMENT INDEX FOR TRUE/MID-PACIFIC GEOTHERMAL VENTURE

FOLDER No. 2

Item No.	Date Rc'vd	Date of Letter/Memo	Subject/Remarks
65	12/15/89		Copy of letter from Hibbard (Historic Preservation) to Moss accepting follow-up Arch. survey
66	12/19/89		Letter from True to Tagomori re: installation of complaint phone line
67	12/7/89		Letter from Kawada to Tagomori re: intent to survey 3rd drill site
68		12/20/89	Letter from Tagomori to Kawada acknowledging item 67
69	11/30/89		Letter from Kawada to Tagomori re: request to haul water 24 hrs a day
70		12/20/89	Letter from Tagomori to Kawada confirming approval of emergency water hauling
71	12/26/89		Advance copy of site plan for T/MP 2nd and 3rd well sites rc'vd from Okahara and Associates